

# The Contribution of Small-Scale Forestry-Based Enterprises to the Rural Economy in the Developing World: The Case of the Informal Carpentry Sector, Sudan

Yahia Omar Adam · Davide Pettenella

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**Abstract** Small-scale forestry-based enterprises connected with wood processing are becoming of growing importance in the rural economy of developing countries. Little attention has been paid to the characteristics of these enterprises and their role in supporting economic development. The objectives of this study are to: (1) determine the socioeconomic characteristics of the operators of these enterprises; (2) assess the contribution of the informal carpentry sector to operators' income; and (3) identify the factors limiting the expansion of the sector. The study was carried out in the Singa district, Sinnar State in 2011. Snowball sampling was used to select 250 operators from five markets in the district. The quantitative and qualitative data were collected using Participatory Rural Appraisal methods. The results revealed that most operators involved in the informal carpentry sector are males aged <30 years and their businesses have been in existence for <10 years. Operators' incomes ranged between USD 100 and 500 monthly on average. The results also indicated that the operators face many constraints (e.g. finance shortage, lack of raw materials, insecure market, lack of technology and lack of organization) to expanding the informal carpentry sector. The study concluded that the informal carpentry sector has potential to contribute to rural economic development through increasing income and reducing rural poverty.

**Keywords** Carpentry · Rural income · Poverty alleviation · Sudan

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Y. O. Adam

Department of Forest Management, Faculty of Forestry, University of Khartoum,  
Code 13314, Box 32 Shambat Campus, Khartoum North, Sudan  
e-mail: gumaa1973@hotmail.com

D. Pettenella (✉)

Dipartimento Territorio e Sistemi Agro-Forestali, Agripolis, Università di Padova,  
Via Università 16, 35020 Legnaro, PD, Italy  
e-mail: davide.pettenella@unipd.it

## Introduction

Small-scale forestry-based enterprises are important in improving livelihoods and alleviating poverty in developing countries. According to the World Bank (2002) forest related businesses contribute to supporting the livelihoods of approximately 90 % of the world's poorest (Arnold 2001; Sunderlin et al. 2005). Small-scale forestry-based enterprises are not only a source of employment, but also a device against poverty by providing some of the basic needs of low income consumers (Billetoft 1989). This kind of enterprise is gaining attention because of its perceived potential in reducing inequality, absorbing a growing rural labour force, reducing rural–urban migration and contributing to national growth (Lanjouw and Feder 2001; Dubey 2008).

The FAO (2005, 2006) has supported a number of projects for small-scale forestry-based enterprises in the provision of various forest goods and services in China, Columbia, Gambia and Uganda. These projects were set up to analyze the enabling conditions for small-scale forestry-based enterprise development and were conducted in tandem with ongoing small-scale forestry projects in Burkina Faso and Mali, Chile, Kyrgyzstan, Mongolia, Mozambique, Nicaragua and Serbia. The experiences and the lessons learned from these projects have been analyzed by FAO in a manual (Lecup 2011). They provide compelling evidence that small-scale forestry-based enterprises in developing regions can generate income opportunities in marginal rural areas. In addition, these projects underscore the importance of community empowerment and participatory approaches as a means for improving local people's livelihoods (Kozak 2007) and the protection and increase of local forest resources (Binh Bui et al. 2005).

Despite being developing countries, the highest rates of forest-based economic activities are generally seen in Africa (Schneider and Enste 2000). The impressive economic contributions of these enterprises exist within an informal sector, in which the operators generally lack legal recognition, free access to markets and resources, and operate in a hostile regulatory and policy environment (Haggblade et al. 2002). It is also believed that marginalized and highly vulnerable segments of the population derive their livelihoods from this informal sector and suffer from high poverty levels, especially in rural areas. To address this problem, it is necessary to look into the potential of the informal sector in rural economic development. Such information is of particular interest to economic policy makers who wish to promote the development of a micro-entrepreneurial sector. This is because of its perceived contribution to dynamic economic efficiency, possibly as a response to growing competitive pressures brought about by trade liberalization. In Sudan, significant numbers, perhaps even a majority of rural people, have little or no social security provision. Thus, a full understanding of the informal carpentry sector in the rural economy and its expansion determinants can be a major step toward formulating policies and programmes that aim at increasing the level of income generation and enhancing the sustainability of the sector. Taking this into consideration, the objectives of the paper are to: (1) determine the socioeconomic characteristics of the operators; (2) assess the contribution of informal carpentry sector to operator's income; and (3) identify the factors limiting the expansion of the sector.

## Methodology

The study area is the Singa district in Sinnar State. The population in the district is a mix of Arab and African tribes and some tribes of western Sudan. The main land uses include traditional extensive livestock grazing, mechanized and irrigated farming, forests, horticulture and animal husbandry. The study area was selected on the basis of the following two criteria: (1) the economic backbone of the area is within the agricultural sector, although this is currently very weak due to population pressure and poor market prices, and (2) the informal carpentry sector is very popular among the people of Singa district. The area is accessible and means of transport are available during the dry season. The study surveyed five market centres (Singa, Abu-Hajar, Abu-Nama, Wad-Elnial and Galgani) in the district. The district has a wide range of trees and wood. The riverside *Acacia nilotica* forests are used to supply the *Sunt* timber to the small-scale forestry-based sector for furniture and carpentry works in the district. There are 471 small-scale enterprises operating in the wood sector, nearly 10 % of which work in furniture production (Forest National Corporation 2011). The wood is available for these enterprises during the dry season from January to May of each year, but there is a scarcity in supply from June to November.

The survey used a case study approach (Yin 1994) to explore the economic potential of the small-scale forestry-based sector. The unit of analysis consisted of operators who manage small-scale enterprises specialized in carpentry in the different sampled markets. The following approach was used in data collection:

- a snowballing sampling technique was used as it is a systematic non-probabilistic purposive sampling method that is very apt for explorative research when informants are difficult to locate and identify. The head of the Union of the forestry-based enterprises in the Singa district was asked to identify the names of operators of small-scale forestry-based enterprises involved in carpentry works;
- identified operators were invited to be interviewed in their workplaces at their convenience; they agreed semi-structured interviews were used to obtain quantifiable and general information from them;
- matrix scoring and ranking involves the use of matrices and counters to compare various issues through scoring. In this study the method was used to compare various constraints that are impacting the informal sector, in which the operators used small pieces of wood as counters to list the constraints they face in order of importance.

Using the snowball sampling technique 250 operators representing 250 enterprises were identified and interviewed; 22 operators refused to be interviewed as they assumed that the questions were related to sensitive data. Interviewing stopped at the number 250 because at that point a saturation sample had been reached where new respondents were unable to give new data.

Data collection focused on two types of information: (1) enterprises' socio-economic quantitative descriptors (turnover, expenditure and profits, number of direct and indirect employees by education level and sex, and business start-up year)

and (2) other qualitative information to describe the enterprises' market profile (type of business and activities involved, ownership, type of equipment and infrastructures, where the enterprise is located, membership of organizations or associations, constraints experienced in operating the business, opportunities for the business, availability of essential services, proximity to the source of raw materials and the market, how to increase sales, what other activities support the enterprise, how to improve the business in the future, and what roles do the government/nongovernmental organizations play in improving the sector's activities).

The quantitative data were analyzed using the SPSS program and presented in the form of descriptive statistics, while the qualitative data were analyzed using context analysis in order to identify the main themes that emerged from the answers given by the respondents. The context analysis was done through: (1) identification of the main themes; (2) assigning codes to main themes; (3) classification of responses under the main themes; and (4) integration of themes and response into the text of the paper. In addition, partial analysis was also done on some data that could not be conducted with the participants using detailed case analysis.

In interpreting the data, it is important to bear in mind that data collected from the informal sector has a serious limitation as the operators rarely keep records. Therefore they have to rely on memory for information. However, it is believed that given the existing information on the informal sector and the participatory methods used to gather the information, the data contain a high degree of reliability. In the field, the major problem, which emerged in almost every enterprise visited, was the lack of concentration of the respondents, when they had to listen to the interviewer as well serve the customers. Since the exercise was participatory, interviews were conducted at respondents' workplaces. The expectations of the respondents were too high; they wanted the exercise to yield results immediately. Before engaging them in the research the objectives of the research were outlined to them, stressing the importance of letting politicians know the role of informal enterprises in income generation and the main constraints to their expansion. This point encouraged them to answer the majority of the questions.

## Findings and Discussion

The results of the survey are presented making reference to three main elements: business characteristics, business constraints, and income generation effects related to the informal carpentry sector.

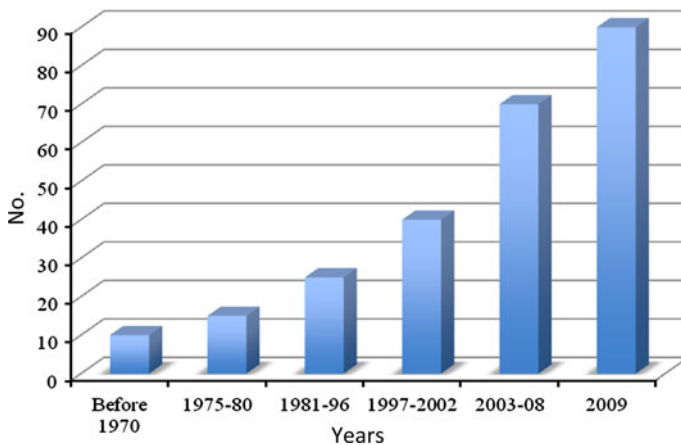
### Business Characteristics

The people actively involved in the informal carpentry sector are all men. Women are completely absent. This finding disagrees with a study conducted in Uganda by Muwonge et al. (2007) who reported that 39 % of those employed in the informal forestry-based enterprises are female. The absence of women employed in the sector may be due to the fact that women lack carpentry sector skills because their main traditional roles include firewood collection, peasant farming, child bearing and

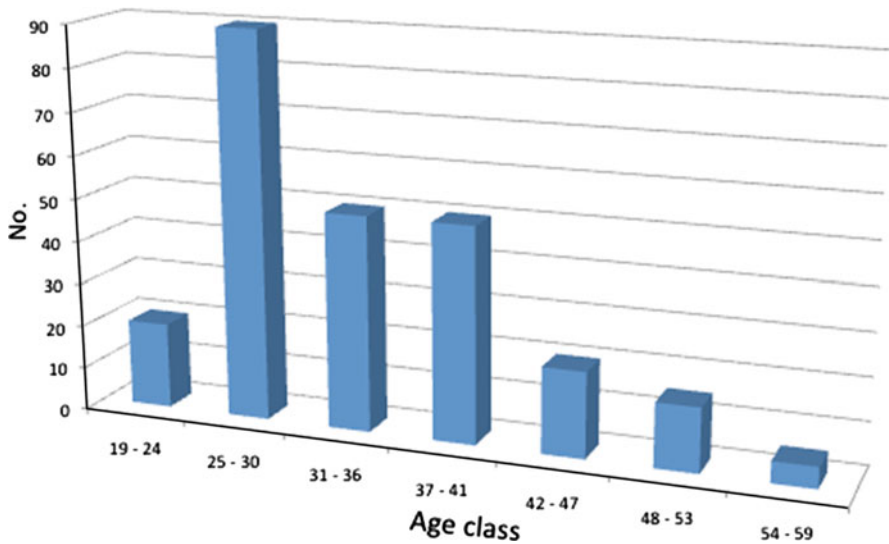
raising. However these roles are slowly superseded by new lifestyles, such as informal education which introduces them to alternative income generating activities. Farm holdings are small and becoming unproductive due to population pressure and reduced fertility. As a coping strategy it has become extremely necessary for women to enter the manufacturing and service sectors to supplement the family's limited sources of income.

More than half (56.4 %) of the businesses visited have been in existence for <10 years, of which about 36 % for <3 years. The trend of the start-ups presented in Fig. 1 shows that there is a tremendously high rate of entry into the sector, but also infers high withdrawal rates due to the duplication of products and unregulated competition. It could also be attributed to rural migration to urban areas in search of better social facilities and opportunities (Muwonge et al. 2007). Some of the operators had tried other businesses such as retail as a way of passing time while waiting to get a formal job somewhere in the near future. This is due to the fact that small-scale forestry-based informal enterprises are insufficient to accommodate the growing numbers of skilled and unskilled job seekers in the country. However, these operators view their businesses as a stable means to obtain income or as a source of self-employment.

The age of operators ranges from 19 to 69 years. About 44 % are <30 years old (Fig. 2). This is an indication that the informal sector is highly practiced in the rural areas by a wide range of participants, including school children when they are free so that they can supplement family incomes. Most of operators cited that the main reason for entering at an early age was a lack of formal employment and alternative sources of income. Indeed, the poor performance of Sudan's domestic economy in the last 20 years has adversely affected employment creation in all sectors of the economy. The operators hope that they will survive despite the hard economic times facing the country. About 26 % were over 40 years old, representing the most established operators. They reported that their work experience attracts enough



**Fig. 1** Number of informal carpentry businesses by year of the start-up



**Fig. 2** Age distribution of operators and number of businesses

customers to keep them operating. They also indicated that they began their businesses when they were in their 30s after trying several other types of enterprise.

The sale of livestock provided the bulk of initial capital, with approximately 22 % of cases identifying this as the main source (Table 1). In descending order of importance, the sources of financing the business are assistance from relatives and friends, agriculture production sale, credit institutions, previous employment and community informal credit. Remittances and loans are most typically mentioned as sources of invested capital. Some respondents reported that they received financial assistance from a formal credit institution (Family Bank) as a secondary source of

**Table 1** Initial sources of financing the carpentry informal sector businesses

| Source of finance                     | Market centers (no) |           |          |            |         | Total |      |
|---------------------------------------|---------------------|-----------|----------|------------|---------|-------|------|
|                                       | Singa               | Abu-Hajar | Abu-Nama | Wad-Elnial | Galgani | No    | %    |
| From previous employment              | 5                   | 7         | —        | 5          | —       | 17    | 6.8  |
| Sale of livestock production          | 9                   | 8         | 14       | 14         | 10      | 55    | 22.0 |
| Sale of cultivated crops              | 6                   | 4         | 6        | 1          | 20      | 37    | 14.8 |
| Assistance from relatives and friends | 15                  | 20        | 5        | 5          | 5       | 50    | 20.0 |
| Community informal credit             | 5                   | —         | 2        | 4          | 4       | 15    | 6.0  |
| From credit institutions              | 18                  | 1         | 3        | 10         | 1       | 33    | 13.2 |
| Unspecified sources                   | 2                   | 10        | 10       | 11         | 10      | 43    | 17.2 |
| Total                                 | 60                  | 50        | 40       | 50         | 50      | 250   | 100  |

capital. The community's informal credit sources are currently becoming an immediate source of finance to members, who are mainly small business owners. However, these sources are inadequate and therefore improving rural small-scale forestry-based enterprise's access to credit is important. Emphasis should not be on the design of specific projects, as has been the case in most instances, but should instead be on adopting a more holistic view and seeking to improve the overall functioning of the rural financial market as a key to improving accessibility to finance (FAO 1987).

The beneficiaries of informal credit from the community stated that they easily access credit; there are no bureaucratic procedures as with formal banks. Assistance from relatives and friends represented about 20 % of the responses. This is common in rural areas, where friends or relatives assist by giving cash or starting capital to a trained artisan who is willing to work. This is sometimes geared towards reducing dependency. About 17.2 % of the respondents did not reveal their sources of finance. The same situation was observed in Uganda where small-scale forestry-based enterprises were established using loans from friends, relatives and money lenders (Muwonge et al. 2007). This may be due to the fact that commercial banks are less likely to enter into a contractual obligation with informal sector operators. In addition, the financial linkage is weak partly because of the stringent conditions and collateral requirements demanded by informal financial institutions in Sudan, which may not be met by small-scale forestry-based informal sector operators. Similarly, the FAO (1987) reported that informal financial institution problems may result from market instability, which causes enterprises to tie up funds in inventories, or policies that exclude small-scale enterprises from the discounted or tax-exempt input prices available to their larger industrial competitors.

Since the informal carpentry sector involves manufacturing, the tools used are very important. In this study it was revealed that 56.4 % of operators obtained their tools by buying new ones (Table 2). They indicated that having new tools, like a mortar for molding furniture, is convenient if no mechanical problems arise from their use, unless these are noticed quickly and put right. However 26.8 % of respondents indicated that second-hand tools work as well as new ones, as long as they are well maintained. Tools such as second-hand clamps, planes and saws can be obtained cheaply. These are normally appropriate for new entrants into the sector

**Table 2** Methods of acquiring equipment in carpentry informal sector

| Nature of equipment acquisition | Market centers (no) |           |          |            |         | Total |       |
|---------------------------------|---------------------|-----------|----------|------------|---------|-------|-------|
|                                 | Singa               | Abu-Hajar | Abu-Nama | Wad-Elnial | Galgani | No    | %     |
| New                             | 34                  | 27        | 25       | 30         | 25      | 141   | 56.4  |
| Second-hand                     | 20                  | 10        | 10       | 17         | 10      | 67    | 26.8  |
| Self-made                       | 2                   | 3         | 3        | 2          | 5       | 15    | 6.0   |
| Inherited                       | 4                   | 6         | 2        | 1          | 9       | 22    | 8.8   |
| Other                           | –                   | 4         | –        | –          | 1       | 5     | 2.0   |
| Total                           | 60                  | 50        | 40       | 50         | 50      | 250   | 100.0 |

as they lack capital and are unsure how their businesses will grow. Cases of self-made equipment were declared during the interviews, with the respondents indicating that not all the machines needed are patented. About 25 % of respondents did not acquire the tools on their own account; 8.8 % inherited them. They indicated that they only have them while searching for new or if necessary second-hand ones. Only 2.4 % of respondents were not willing to tell where they acquired their tools. These differences in technological needs of informal enterprises call for clustering of industry segments in order to distinguish differing needs, areas of weakness and strengths. Sometimes the problem of production technology is simply the unavailability or shortage of simple tools and equipment used in existing production processes and techniques. Thus improvements in the efficiency of the current methods used may be more crucial than new production techniques. Emphasis should be on reducing wastage and costs.

### Business Constraints

The informal sector faces a wide array of problems (Table 3). All the operators cited finance as the principal constraint they encounter in maintaining their competitive position, because the formal credit institutions are part of the public sector monopoly and are governed by government regulations. Lack of finance was also indicated as a clear symptom of other constraints. The bureaucracy that administers them is unfriendly to the illiterate and semi-literate in the informal sector. When credit is available the interest rates and requirements for collateral are far beyond the capacity of small enterprises. Small and insecure markets, lack of raw materials and lack of suitable tools and equipment were often reported. Small and insecure markets are attributed to the low incomes of the rural people, whose earnings are determined by the ever-fluctuating market prices of their seasonal farm production. Similarly, FAO (1987) reported that most small-scale forestry-based products markets are predominantly for low cost goods, with a seasonal demand due to the fluctuations in rural incomes and activities.

**Table 3** Constraints faced by the carpentry informal sector business operators

| Market constraint                    | Market centers (No) |          |          |            |         | Total |      |
|--------------------------------------|---------------------|----------|----------|------------|---------|-------|------|
|                                      | Singa               | AbuHajar | Abu-Nama | Wad Elnial | Galgani | No    | %    |
| Finance shortage                     | 20                  | 30       | 17       | 15         | 20      | 102   | 41.6 |
| Lack of raw materials                | 10                  | 5        | 3        | 8          | 15      | 41    | 16.0 |
| Small and insecure market            | 2                   | 2        | 4        | 5          | 8       | 21    | 8.0  |
| Lack of suitable tools and equipment | 1                   | 7        | 5        | 10         | 5       | 28    | 11.2 |
| Lack of organization/cooperation     | 4                   | 1        | 2        | 4          | 4       | 15    | 6.0  |
| Unfriendly bureaucracy               | 10                  | 3        | 3        | 2          | 1       | 19    | 7.6  |
| Lack of infrastructure               | 3                   | 2        | 6        | 6          | 7       | 24    | 9.6  |
| Total                                | 50                  | 50       | 40       | 50         | 60      | 250   | 100  |



Carpenters mainly cited a lack of raw materials, i.e. good quality timber, which is rarely available due to deforestation to create space for agriculture. When this quality is available, their products are too expensive for customers to afford as some of the raw materials used are subjected to high taxes. The small-scale forestry-based enterprises in developing countries experience difficulties in gaining access to raw materials due to distance or to legal, administrative, price or infrastructural barriers which include controls, exclusive allocation to large industries, complicated licensing or auctioning procedures and demand for high deposits (FAO 1987). Goods are normally made to order, meaning that most carpenters operate on marginal profits. These results agree with Fisseha (1987), who listed the same major constraints and barriers for small-scale forestry-based enterprises operating in developing countries.

In seeking to solve the raw material supply problems, new approaches to forest resource management are needed which recognize that small-scale forestry-based enterprises constitute both an important part of the forest and forest products sector, and a major source of livelihood for rural people in Sudan.

Lack of suitable tools and equipment was also indicated as a problem, with the consequence of not being able to produce enough goods and of a high enough quality to meet the demands of customers. They are forced to hire tools, equipment and services at a fee, which could be worthwhile to retain customers' confidence. On inquiring whether they could increase the price of their products depending on the operation cost, they said that they would automatically lose the market. Lack of infrastructure was ranked as the third constraint. Most operators would like to access markets in distant places, but a lack of facilities such as general information means they do not have this opportunity. Electricity was cited as an important infrastructure, which is seriously lacking in the rural areas. Similarly, Reinikka and Svensson (1999) reported that unreliable and inadequate electricity supply was the main factor influencing small-scale forestry-based enterprises in Uganda. Many operators were willing to improve technological inputs in order to produce competitive products faster and at low production costs if electricity was made available. However, it was very interesting to note that even those whose workshops have access to electricity have not improved their production any better than those without an electricity supply. They indicated that a lack of capital to upgrade tools and equipment was a major constraint. Indeed, these artisans work with very little and utilize low-level technology and skills (Bremner 1996). Some operate using family labour or employ a few hired workers whose labour input is largely informal, unregistered and unrecorded in official employment statistics.

The lack of organizations or co-operatives was also cited as a problem, but ranked last as it was not cited as a serious constraint. However, if such organizations existed they could help the artisans bargain as a group for fairer prices for their goods. Lack of organization and cooperation influences the financial returns due to its contribution to high transaction costs that prevent some operators from transporting their products to distant markets. In addition, the individual trading of the products from small-scale forestry-based enterprises is representative of the weak competition between the operators, and this limits the bargaining power in local markets due to inadequate information on products

market conditions and prices. Some operators indicated that they had lost customers to colleagues who charged very low prices for their products. The issue of patent rights was not respected. Most new products were copied and reproduced at even cheaper rates. This has kept the operators turning out the same products throughout their career.

The vast majority of carpenters have undergone some sort of training, either formal or informal. Approximately 26 % of the respondents indicated that they acquired their skills at a formal institution, while the remaining 74 % received on the job training. Informal training denotes the apprenticeship system whereby the trainee/apprentice pays the master craftsman a fixed sum of money to acquire the necessary skills to become self-employed or employed in a certain trade. On inquiry as to why they liked this approach, most of them mentioned that practical learning is more relevant than a classroom education, which relies heavily on theoretical, textbook-based learning. The training in the formal institutions tends to be supply driven; rarely being sensitive to the needs and circumstances of the informal sector, as the training is still geared towards the formal sector. This agrees with the study conducted in Uganda by Muwonge et al. (2007) who stated that 96 % of informal sector operators do not have formal vocational training. These statistics suggest the need to strengthen knowledge empowerment among the operators in the informal sector.

### Income Generation

As shown in Table 4, 38.8 % of all the operators visited are earning between USD 100–500 per month. This income is on average sufficient to sustain the business and the operator, although only marginally. Most of the businesses are newly established (Table 3), and take considerable time to become known to the customers. But the old businesses that are poorly managed still yield much lower returns than would be expected; for example, 2.8 % of the businesses whose operators are over 50 years of age are still in the lowest income category (Table 4). These are rich entrepreneurs; they are mostly engaged in large-scale production, for example having orders to supply institutions with furniture, while some are involved in sub-contracting from large firms enabling them to enjoy big concessions, such as in transportation. Operators between the ages of 40–49 years represent approximately 6 % of the businesses whose income is in the range USD 100–500 and around 1 % with an income of USD 600–1,000. The second highest income age groups are 25–29 and 35–39 years, with 11 % of operators in each group earning between USD 1,100–1,500 per month. The income category between USD 2,100–2,500 was poorly represented accounting for only approximately 12 % of the total businesses visited (Table 4).

The earnings of the majority of people engaged in rural informal sector activities range between USD 1,000–1,500 per month, which compares to low ranking job groups in the formal sector. The employers earn more than the employees in the informal sector. This is because the labor legislative requirements are rarely recognized. The employers tend to exploit their workers, especially those doing an apprenticeship. It is very clear that most operators in carpentry businesses do not

**Table 4** Incomes per month in US\$ by age in years of the operators

| Income      | Age (no operators) |       |       |       |       |       |       |      | Total |      |
|-------------|--------------------|-------|-------|-------|-------|-------|-------|------|-------|------|
|             | 15–19              | 20–24 | 25–29 | 30–34 | 35–38 | 39–44 | 45–49 | > 50 | No    | %    |
| 100–500     | 5                  | 30    | 20    | 10    | 10    | 10    | 5     | 7    | 97    | 38.8 |
| 600–1,000   | 8                  | 19    | 15    | 4     | 3     | 2     | 2     | 3    | 56    | 22.4 |
| 1,100–1,500 | 2                  | 15    | 10    | 2     | 2     | 1     | 1     | –    | 33    | 13.2 |
| 1,600–2,000 | –                  | 13    | 12    | –     | 7     | 2     | –     | –    | 34    | 13.6 |
| 2,100–2,500 | –                  | 12    | 13    | –     | 5     | –     | –     | –    | 30    | 12.0 |
| Total       | 15                 | 89    | 70    | 16    | 27    | 15    | 8     | 10   | 250   | 100  |
| %           | 6.0                | 35.6  | 28.0  | 6.4   | 10.8  | 6.0   | 3.2   | 4.0  | 100   |      |

have entrepreneurial qualities. Their incomes have the potential to grow but they seem to be reluctant to boost them. They dwell on blaming the constraints facing their businesses rather than on the possibilities for growth. This is attributed to a lack of managerial and public relations qualities. For example, they rarely keep records of their daily operations. This is mainly disregarded because of the small size of the enterprise and few activities. They cannot account for whether their businesses are growing or actually getting smaller.

The number of workers per enterprise seems to reflect how well established or how ambitious the operators are. Approximately 88 % of the enterprises employ no more than 2 workers, with an average of 1.5 workers. Most of these employees are apprentices who are unpaid or poorly paid. Approximately 12 % of the enterprises employ 3 people. This implies that most operators work alone, only hiring employees when the workload is heavy.

In this study the reasons for carpenters setting up in business varied. Most operators started the enterprises as a source of employment, representing approximately 53 % of the total businesses visited (Table 5). Moreover, it was undertaken after acquiring training from either formal institutions or from an apprenticeship. The operators cited that, due to mass unemployment in the country, joining the informal sector was the only alternative after making several vain attempts to secure formal employment. In addition to employment, small-scale forestry-based enterprises are important as they provide above average incomes to entrepreneurs and their families, and wage income to employees (even if sometimes below the minimum wage level); transfer skills through informal training; and generally contribute to the local and national economy and sometimes to exports. An important consideration is that earnings from the rural informal sector improve operators' income security. Also, people without land and other disadvantaged groups are well represented among those gaining income and employment from the informal carpentry sector.

Since Singa district's economy is mainly agricultural based, about 24 % of the enterprises were started to supplement agricultural production. This shift into the informal sector from the mainstay economic activity is attributed to low earnings from agriculture. One carpenter noted "...imagine a 2 kg bag of hybrid sorghum

**Table 5** Reasons for entering the carpentry informal sector

| Reasons                        | Market centers (No) |           |          |            |         | Total |      |
|--------------------------------|---------------------|-----------|----------|------------|---------|-------|------|
|                                | Singa               | Abu-Hajar | Abu-Nama | Wad-Elnial | Galgani | No    | %    |
| Source of employment           | 30                  | 25        | 30       | 27         | 22      | 134   | 53.6 |
| Self-employment is better      | 10                  | 5         | 2        | 3          | 5       | 25    | 10.0 |
| Promising business opportunity | –                   | 2         | 1        | 4          | 2       | 9     | 3.6  |
| Supplement farm income         | 15                  | 10        | 5        | 12         | 18      | 60    | 24.0 |
| Survival after retirement      | 5                   | 8         | 2        | 4          | 3       | 22    | 8.8  |
| Total                          | 60                  | 50        | 40       | 50         | 50      | 250   | 100  |

seeds costs 250 Sudanese pounds and 2 kg of harvested sorghum is sold for 6 Sudanese pounds and on top of this you need commercial fertilizer to grow the seeds. Since I have no other income how many bags of harvested sorghum do I need to sell to buy two bags of hybrid seed and fertilizer in order to plant?” It seems justifiable for peasants who are faced with this situation to diversify their sources of income. About 8 % of the visited operators mentioned one of the most critical situations which ‘forces’ entry into the informal sector, i.e. retirement. Most families in the district are living below the poverty line, and in Sudan, the cost of living is unaffordable to these families. The children are forced to drop out of school in order to join their parents in earning some income for survival. Self-employment was identified as another important reason for entering these sectors. About 10 % of the visited enterprises indicated that being self-employed is better. One is able to decide what to do, without being compelled by anybody else to do something. The same individual enjoys productivity benefits. About 3 % of operators reported that the carpentry sector is good business. The businesses are closely intertwined with people’s daily lives. As people grow up and marry they need new furniture and as children are going to school in large numbers they need school uniforms and desks. Every day there is a beehive of activity in their workplaces. They indicated that this encourages them to stay in the business.

### Concluding Remarks

The informal carpentry sector has a significant role to play in the rural economy, especially in helping vulnerable rural groups to obtain an extra source of income. Similarly, the FAO (1987) stated that the rural informal sector as a whole is a major source of rural livelihoods in developing countries, often next only to agriculture in terms of employment. However, a fundamental problem facing the sector is the availability of markets. The sector suffers from low demand caused by the poverty of the rural population, small sizes of the enterprises and competition from urban production. These constraints need to be overcome in order to enhance the income generating capacity of the informal carpentry sector. The growth potential of most

businesses is limited by the unavailability of essential services. Electricity, training and microfinance are the most basic services that should be given priority.

The study results laid the groundwork for recommendations on the informal sector development with particular emphasis on the small-scale wood-based processing activities. The support should be aimed at issues such as making relevant information about the informal sector available to the operators. This can be achieved, for example by having contacts with established firms/experts to obtain technical and managerial training and counseling. The established firms/experts have the ability to transfer expertise in the form of growth-focused assistance to the existing informal carpentry sector. Assistance should also be provided in the form of market information, trade organization and skills development in the use and maintenance of small tools and machines, which will reduce operation and transaction costs. Credit should be tied to the provision of appropriate tools, raw materials and equipment as most operators have pressing financial needs and low capabilities of financial management. The development of the informal carpentry sector could induce more forest degradation and deforestation or, on the contrary, the sector could lead to more efficient use of raw materials, and more value attribution to forests.

## References

- Arnold JEM (2001) Forestry, poverty and aid. Center for International Forestry Research (CIFOR), Bogor, Indonesia. Occasional Paper No. 33:14–16
- Billetoft J (1989) Rural non-farm enterprises in western Kenya, spatial structure and development. Paper No 89.3. Center for Development Research, Copenhagen, Denmark, pp 12–14
- Binh Bui H, Harrison S, Lamb D, Brown SM (2005) An evaluation of the small-scale sawmilling and timber processing industry in northern Vietnam and the need for planting particular indigenous species. *Small-Scale For* 4(1):85–100. doi:[10.1007/s11842-005-0006-9](https://doi.org/10.1007/s11842-005-0006-9)
- Bremar J (1996) Footloose labour: working in India's informal economy. Cambridge University Press, Cambridge, pp 200–201. ISBN 9780921568241
- Dubey P (2008) Investment in small-scale forestry enterprises: a strategic perspective for India. *Small-Scale For* 7(2):117–138. doi:[10.1007/s11842-008-9045-3](https://doi.org/10.1007/s11842-008-9045-3)
- FAO (1987) Small-scale forest-based processing enterprises. Forestry Paper 79. Food and Agriculture of the United Nations, Rome. ISBN: 92-5-1025-703, pp 35–52
- FAO (2005) Community-based commercial enterprises development for the conservation of biodiversity in Bwindi World Heritage Site, Uganda. Food and Agricultural Organization (FAO) of the United Nations, Forestry Policy and Institutions Service (FONP), Forestry Department. Rome, Italy, pp 9–29. <http://www.fao.org/forestry/9660-06cc0f0249e95b986b8ae8a8686aa8a9b.pdf>. Accessed Aug 2012
- FAO (2006) Community-based commercial enterprises development for the conservation of biodiversity in Mount Emei World Heritage Site, Sichuan, China. Food and Agricultural Organization (FAO) of the United Nations, Rome, Italy. Forestry Policy and Institutions Working Paper 17:10–19. [foris.fao.org/static/data/enterprises/China-casestudy.pdf](http://foris.fao.org/static/data/enterprises/China-casestudy.pdf). Accessed August, 2012
- Fisseha Y (1987) Basic features of rural small-scale forest-based processing enterprises in developing countries. FAO Forestry Paper (79), Food and Agricultural Organization (FAO) of the United Nations, Rome, Italy. [www.fao.org/docrep/s8380e/s8380e05.htm](http://www.fao.org/docrep/s8380e/s8380e05.htm). Accessed August, 2012
- Forest National Corporation (2011) Annual statistics report in Sinar State, Singa District
- Hagblade S, Hazell P, Reardon T (2002) Strategies for stimulating poverty-alleviating growth in the rural non-farm economy in developing countries. International Food Policy Research Institute and

- Rural Development Department, The World Bank, Washington. <http://www.ifpri.org/sites/default/files/publications/eptdp92.pdf>. Access Aug 2012
- Kozak R (2007) Small and medium forest enterprises: instruments of change in developing world. University of British Columbia, Vancouver, British Columbia, Canada, pp 21–23. [http://www.rightsandresources.org/documents/files/doc\\_3132.pdf](http://www.rightsandresources.org/documents/files/doc_3132.pdf). Accessed Aug 2012
- Lanjouw P, Feder G (2001) Rural non-farm activities and rural development: from experience towards strategy. Development Economics Research Group, World Bank, Washington, USA, pp 30–34
- Lecup I (2011) Community-based tree and forest product enterprises: market analysis and development. Manual. Food and Agricultural Organization (FAO) of the United Nations, Rome, Italy. <http://www.fao.org/docrep/014/i2394e/i2394e00.pdf>. Accessed Aug 2012
- Muwonge A, Obwona M, Nambwaayo V (2007) Enhancing contribution of the informal sector to national development: the case of Uganda. Economic Policy Research Centre (EPRC), 51 Pool Road Makerere University, Kampala, Uganda. p 8
- Reinikka R, Svensson J (1999) Confronting competition investment response and constraints in Uganda. Working Paper no. 2242. Washington DC. World Bank, pp 30–35. doi:[10.1596/1813-9450-2242](https://doi.org/10.1596/1813-9450-2242). <http://elibrary.worldbank.org/abstract/2242.pdf?jsessionid=akpqu14t9yab.z-wb-live-01?itemId=/content/workingpaper/10.1596/1813-9450-2242&mimeType=pdf>. Accessed Aug 2012
- Schneider F, Enste D (2000) Shadow economies: the Canadian statistical perspectives. Canadian Economic observer, Cat. No 11-010(3):16–33
- Sunderlin WA, Angelsen B, Belcher B, Burgers P, Nasi R, Santoso L, Wunder S (2005) Livelihoods, forests, and conservation in developing countries: an overview. *World Dev* 33(9):1383–1402. doi:[10.1016/j.worlddev.2004.10.004](https://doi.org/10.1016/j.worlddev.2004.10.004)
- World Bank (2002) Sustaining forests. A World Bank Strategy. World Bank Report of the World Summit on Sustainable Development. World Bank. Washington, DC, USA, pp 2–5
- Yin R (1994) Case study research: design and methods. Sage, Beverly Hills, pp 1–38